Energy consumed by Forest Service administration includes vehicle use for all administrative activities; building lighting, heating and air conditioning; road maintenance and construction projects performed by Forest Service personnel; and fuel used for small engines, etc.

Table IV-55 displays the estimated average annual energy consumption by alternative for the short and long-term. These estimates are gross predictions, since few applicable records or literature are available to estimate energy consumption associated with Forest management activities.

TABLE IV-55.

ENERGY CONSUMPTION
(Average Annual Consumption, Unit of Measure BTU's x 10^9)

Alternative	Timber Harvest	Range Use	Recreation	Road Const/ Reconst	Forest Service Admin.	TOTAL	Percent of Current
Current	21.4	114.9	591.3	4.7	18.2	750.5	100%
Short-Term (1981-1990)							
1	26.8	117.5	688.0	3.7	20.8	856.8	114%
2	16.8	119.8	621.7	2.4	18.9	779.6	104%
3	31.2	122.1	709.0	3.7	21.5	887.5	118%
4	10.3	111.3	688.0	0.6	20.2	830.4	111%
5	26.8	125.6	688.0	3.7	21.0	865.1	115%
6	10.3	111.3	688.0	0.6	20.2	830.4	111%
7	22.9	125.4	688.0	2.9	20.9	860.1	115%
8	26.8	118.0	688.0	3.8	20.8	857.6	114%
9	16.8	113.1	682.9	2.1	20.3	835.2	111%
Long-Term (1991-2030)							
1	27.5	120.5	1,122.6	1.6	31.6	1,302.6	174%
2	17.6	119.8	1,055.9	0.7	29.7	1,223.7	163%
3	34.7	122.2	1,076.6	1.7	30.7	1,265.9	169%
4	11.5	111.3	1,171.4	0.3	32.1	1,326.6	177%
5	27.5	125.6	1,090.2	1.1	31.0	1,275.4	170%
6	11.5	111.3	1,171.4	0.3	32.1	1,326.6	177%
7	24.6	125.4	1,088.8	1.0	30.9	1,270.7	169%
8	26.8	120.9	1,130.8	1.0	31.9	1,311.4	175%
9	17.1	113.1	1,075.1	0.6	30.0	1,235.9	165%

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The Plan, Management Requirements provide direction to protect natural resources that could be irreversibly affected by management activities. Irreversible resource commitments refer to resources that are renewable only over a long time period, such as soil productivity, or to depletable resources, such as cultural resources or minerals.

Gravel and rock extracted for road construction and reconstruction is an irreversible action. Mining and dam construction are also examples of activities that represent irreversible commitment of resources.

Extraction of depletable minerals and energy resources is irreversible since the minerals are no longer available in the future. All applicable laws and regulations are referenced in the Forest planning records. The Forest Service's role is to manage the surface resources to minimize adverse environmental impacts while providing for the exploration and development of the mineral resources.

The irretrievable commitment of natural resources is the production loss or use loss of renewable resources, due to allocation or management decisions. This represents opportunities foregone for the time period that the resource cannot be used. Construction of arterial and collector roads, ski areas and developed recreation sites are irretrievable resource commitments because these activities will remove land from productivity. There are also irretrievable commitments of resources associated with the designation of wilderness. The wilderness values foregone for Fossil Ridge Wilderness Study Area and Cannibal Plateau Further Planning Area are discussed in Appendix I.

Table IV-56 displays the irreversible and irretrievable resource commitments. These are associated with road construction and reconstruction. The irreversible resource commitments are related to gravel and rock extracted for road surface. The irretrievable resource commitments are acres taken out of vegetation, etc. by road construction.

Table IV-57 displays irretrievable resource commitments associated with average annual outputs below the benchmark maximum level for the 50-year planning horizon.

TABLE IV-56.

IRREVERSIBLE AND IRRETRIEVABLE RESOURCE COMMITMENTS
(Average Annual Quantity)

Alternative	Irretrievable Acres*		Irreversible Cubic Yds x 10^3**	
	Short Term 1981-1990	Long Term 1991-2030	Short Term 1981-1990	Long Term 1991-2030
1	97.2	29.2	35.8	10.8
2	60.2	20.2	22.1	7.4
3	98.1	46.6	36.1	17.1
4	16.5	5.8	6.1	2.1
5	96.4	31.3	35.5	11.5
6	16.5	5.8	6.1	2.1
7	76.2	25.5	28.0	9.4
8	70.0	20.2	25.8	7.4
9	55.2	17.7	20.3	6.5

* Acres taken out of production by road construction.
** Thousand Cubic yards gravel used for road surfacing.

TABLE IV-57.

IRRETRIEVABLE RESOURCE COMMITMENTS
(Summary All Decades, Average Annual)

Resource Output	Units*	Maximum Level**	Annual Irretrievable Loss By Alternative									Highest Loss
			1	2	3	4	5	6	7	8	9	
Programmed Timber Sales Offered	MMBF	176.9	140.0	145.0	132.1	161.3	140.4	162.1	145.3	141.4	154.6	162.1
Permitted Livestock Grazing	MAUM	499.9	165.7	167.9	161.8	189.0	153.1	189.0	153.1	164.9	184.9	189.0
Total Dispersed Recreation Use	MRVD	4749.2	0	0	0	0	0	0	0	0	0	0
Big Game Winter Range Carrying Capacity	M Animals	93.4	6.3	5.9	5.4	7.2	5.8	7.0	7.2	6.2	7.5	7.5
Total Developed Recreation Use	MRVD	1107	259.8	380.6	139.0	139.0	380.6	259.8	380.6	259.8	454.0	454.0
Downhill Skiing Use	MRVD	689.1	0	0	0	0	0	0	0	0	0	0
Wilderness Use	MRVD	467	190.1	190.1	190.1	190.1	190.1	190.1	190.1	190.1	190.1	190.1
Water Yield	M Ac Ft	.084	.067	.072	.066	.072	.068	.072	.070	.063	.074	.074

* MRVD = Thousand Recreation Visitor Days
M Animals = Thousand Animals
MAUM = Thousand Animal Unit Months
MMBF = Million Board Feet
M Ac Ft = Thousand Acre Feet

**Reference Maximum Benchmark in Chapter II.

ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

All activities that occur on the Forest will cause some degree of environmental impact. The degree or severity of the adverse effects are minimized through the Forest management requirements and the management area direction in the accompanying Plan. Some impacts cannot be avoided if management activities occur regardless of alternative. These effects include:

--Intermittent decrease in air quality due to dust from road construction, maintenance, and use; mineral exploration and development activities; and from smoke due to campfires, prescribed burns, and wildfires.

--Short-term and localized increases in soil erosion and stream sedimentation due to land disturbing activities.

--Short-term changes in the landscape from silviculture and road construction that may be disturbing to Forest visitors.

--Possible future loss of wilderness character in those areas not recommended for wilderness classification.

--Some disruption or change in wilderness recreation opportunities due to mineral leases or activities under the mining laws in designated wilderness.

--Disruption of prehistoric or historic evidence of man's occupancy of the Forest.

--Elimination of small areas from vegetation production due to construction of permanent physical developments such as roads, trails, range structural improvements, and wildlife habitat structural improvements.

--Increased conflicts between recreation use and other land use activities related to commodity production.

--Solitude loss due to increased management and use activities in certain areas.

--Temporary wildlife disturbance in some locations because of increased human activity.

--More intensively managed grazing systems in Alternatives 1, 2, 3, 5, 7, and 8 will impact individual permittees.

--Energy will be used to manage and use the natural resources.

Mitigation measures are included in the Forest management requirements and management area direction. They will limit the adverse effects that cannot be avoided.

SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE OF LONG-TERM PRODUCTIVITY

The relationship between the short-term uses of man's environment and the maintenance and enhancement of long-term productivity is complex. For this

assessment, short-term uses are those that generally occur on a yearly basis on some part of the Forest. These include livestock grazing as a use of the forage resource, timber harvest as a use of the wood resource, and recreation and irrigation as uses of the water resource.

"Long-term" refers to longer than 10 years. Productivity refers to the capability of the land to provide market and non-market outputs and values for future generations. Soil and water are the primary factors of productivity and represent the relationship between short-term uses and long-term productivity. The land allocations and permitted activities must not significantly impair the long-term land productivity.

The Proposed Action must incorporate sustained yield of resource outputs while maintaining resource productivity. The specific direction and mitigation measures included in the Forest Management Requirements ensure that long-term *productivity will not be impaired by the application of short-term management* practices.

Each alternative was analyzed to assure that the Forest Management Requirements could be met. The alternative was changed if some aspect did not meet these requirements. Thus, in every alternative, the Forest's long-term productivity is assured.

As stated earlier, the effects of short-term or long-term uses are extremely complex and depends on management objectives and the resources to be emphasized. No alternative will be detrimental to the long-term productivity of the Forest.

The prescriptions and effects of Plan implementation will be monitored to provide data to assure that standards for long-term productivity will be met. Monitoring requirements and standards will apply to all alternatives and are included in Chapter IV of the accompanying Plan.

NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION POTENTIAL OF ALTERNATIVES

All alternatives considered in detail are designed to conform to applicable laws and regulations. No alternative will be detrimental to the long-term productivity of the Forest. Forest management requirements were developed with the planning principles stated in 36 CFR 219.1, specific Management Requirements presented in Chapter III, Plan, and 36 CFR 219.13, Management Requirements. These help accomplish goals and objectives of each alternative presented in Chapter II. They accomplish the goals and objectives common to all alternatives presented in Appendix K. Forest standards and guidelines displayed in the Prescriptions for Management Areas, meet the specific *management requirements outlined in 36 CFR 219.13.*

URBAN QUALITY, HISTORIC AND CULTURAL RESOURCES; THE DESIGN OF THE BUILT ENVIRONMENT

The goal of the Forest Service's Cultural Resources Management (CRM) program is to preserve significant cultural resources in their field contexts and to ensure that such resources remain available for different uses on a long-term

basis. These uses include research, social/cultural purposes, recreation, and education. The alternatives are evaluated as to their direct and indirect effects on the CRM goal.

The following criteria on listed or eligible National Register of Historic Places properties, established in 36 CFR 800, provide a suitable basis for effects comparison. However, not all of the Forest's significant cultural resources will qualify for such listing.

--Destruction or alteration of all or part of a property.
--Isolation from or alteration of the property's surrounding environment.
--Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting.
--Neglect of a property resulting in its deterioration or destruction.
--Transfer or sale of a property without adequate conditions or restrictions regarding preservation, maintenance, or use.

The alternatives that allow for a high degree of land disturbing and/or altering activities can be considered to have a high potential for adversely affecting cultural resources. However, the potential adverse affects of a high disturbance alternative will be significantly reduced, and often totally eliminated, by planning activities to avoid areas of high cultural resource sensitivity.

The Forest Management Requirements also ensure that all of the alternatives will be compatible with the CRM goal. However, Alternatives 4, 6, and 9 have the highest compatibility with the goal as they require the least amount of ground disturbing activities to implement.

All alternatives recommend action on the following special interest areas and cultural sites:

--The proposed Alpine Tunnel Historic District.
--The Dry Mesa Dinosaur Quarry.
--The Slumgullion Earthflow National Natural Landmark.
--The proposed Ophir Needles National Natural Landmark.
--The proposed Escalante Creek Research Natural Area.
--The proposed Englehart Archeological District.
--The Mount Emmons Iron Bog.

The Tabeguache Ponderosa Pine area is recommended as a proposed Research Natural Area in Alternatives 1, 2, 4, 6, 7, 8, and 9.

The Gothic Research Natural Area will retain its designation in all alternatives.

MITIGATION SUMMARY OF ENVIRONMENTAL CONSEQUENCES

The management prescriptions displayed in Plan Chapter III include mitigation measures for the environmental consequences of conducting a particular management activity. These measures are contained within the General Direction and Standard and Guideline statements of the overall Forest Direction and individual management prescriptions. Table IV-58 displays possible major environmental impacts and lists the General Direction and Standard and Guideline numerical designation where appropriate mitigation measures are located.

TABLE IV-58.

MITIGATION OF ENVIRONMENTAL IMPACTS

POTENTIAL IMPACT	LOCATION* FOREST DIRECTION/ PRESCRIPTION NUMBER	MANAGEMENT ACTIVITY DESCRIPTION AND NO.	GENERAL DIRECTION STATEMENT NUMBER	STANDARD AND GUIDELINE NUMBER
Impacts on Vegetation				
Vegetation destruction and/or alteration i.e., road construction, recreation use in sensitive areas, watershed projects	9A	Water Resource Improvement and Maintenance (F05 & 06)	0690	
	9A	Transportation Management (L01 & 20)	0724	
	FD	Visual Resource Management (A04)	0366	
	FD	Dispersed Recreation Management (A14 & 15)	0040, 0353	6023, 8022GM
Loss of productivity in range vegetation	FD	Range Resource Management (D02)	0058, 0057, 0499	6041
	6A, 6B, 10E	Range Resource Management (D02)	0325, 0326	
	7A, 7C, 7E	Range Improvement and Maintenance (D03, 04, 05, & 06)	0132	6072
Changes in diversity due to vegetation treatment	FD	Diversity on National Forests (A00)	0061, 0060, 0288	6030, 6031, 6032, 6033, 6237
	4C	Range Resource Management (D02)	0414	6172
	4D	Visual Resource Management (A02)	0425	
	5A	Wildlife and Fish Resource Management (C01)		6166, 6167
	5B	Wildlife and Fish Resource Management (C01)		6168, 6177

TABLE IV-58. (Cont.)

POTENTIAL IMPACT	LOCATION*			
	FOREST DIRECTION/ PRESCRIPTION NUMBER	MANAGEMENT ACTIVITY DESCRIPTION AND NO.	GENERAL DIRECTION STATEMENT NUMBER	STANDARD AND GUIDELINE NUMBER
	9A	Wildlife Habitat Improvement and Maintenance (C02, 04, 05, & 06)	0658	
Loss or disturbance of riparian or wetland vegetation	9A	Transportation System Management (L01 & 20)	0724	
	FD	Riparian Area Management (F03)	2120GM	6147
	9A	Wildlife Habitat Improvement and Maintenance (C02, 04, 05, & 06)		6147
	FD	Riparian Area Management (F03)	0402, 0403	
	9A	Wildlife Habitat Improvement and Maintenance (C02)	0402	
	FD	Dispersed Recreation Management (A14 & 15)	0353	
	FD	Rights-of-Way and Land Adjustments (J02, 13, 15, 16, 17, & 18)	0006	
	9A	Soil Resource Management (KA1)	0091	
	9A	Range Resource Management (D02)	0666	
Removal of commercial timber	FD	Silvicultural Prescriptions (E03, 06, & 07)	0016, 0019	8100GM, 6012
	FD	Reforestation (E04)	0013, 0141, 0142	6005, 6006

TABLE IV-58. (Cont.)

POTENTIAL IMPACT	LOCATION* FOREST DIRECTION/ PRESCRIPTION NUMBER	MANAGEMENT ACTIVITY DESCRIPTION AND NO.	GENERAL DIRECTION STATEMENT NUMBER	STANDARD AND GUIDELINE NUMBER
	2A, 2B, 3A, 4B, 4C, 4D, 5B, 6A, 6B, 7A, 7C, 7E, 9A, 9B, 10E	Silvicultural Prescriptions (E03, 06, & 07)	0500	
	2A, 2B, 3A, 7A, 7C, 7E, 9A	Silvicultural Prescriptions (E03, 06, & 07)		6316
	1B, 4B, 4C, 4D, 5B, 6A, 6B, 7A, 7C, 7E, 9B, 10E	Silvicultural Prescriptions (E03, 06 & 07)		6014
Increase in insects and disease affecting commercial timber land	FD	Protection (P35)	0148	
Damage by other uses in tree planting	7A, 7C, 7E	Range Improvement and Maintenance (D03, 04, 05, & 06)	0132, 0133	
Conversion of aspen to other species	FD	Diversity on National Forests and National Grasslands (A00)	0286	
	4D	Diversity on National Forests and National Grasslands (A00)	0422	
	4D	Silvicultural Prescriptions (E03, 06, & 07)	0428	6258
	4D	Fuel Treatment (P11 through 14)	0483	6636
WILDLIFE AND FISH MITIGATION MEASURES				
Habitat destruction and alteration	FD	Wildlife Habitat Improvement and Maintenance (C02, 04, 05, & 06)	0051, 0448	6188, 6660, 6312, 6146

TABLE IV-58. (Cont.)

POTENTIAL IMPACT	LOCATION*			
	FOREST DIRECTION/ PRESCRIPTION NUMBER	MANAGEMENT ACTIVITY DESCRIPTION AND NO.	GENERAL DIRECTION STATEMENT NUMBER	STANDARD AND GUIDELINE NUMBER
	FD	Range Improvement and Maintenance (D03, 04, 05, & 06)	0416	6277, 6247
	4B	Range Resource Management	0416	6247
	4C	Range Improvement and Maintenance (D03, 04, 05, & 06)	0416	6247
	FD	Silvicultural Prescriptions (E03, 06, & 07)	0014	
	3A	Wildlife Habitat Improvement and Maintenance (C02, 04, 05, & 06)	0612	
	2A, 2B, 6A, 6B, 7A, 7C, 7E, 9A, 9B, 10C	Dispersed Recreation Management (A14 & 15)	0154	
	4D	Wildlife and Fish Resource Management (C01)		6254, 6262
	FD	Wildlife Habitat Improvement and Maintenance (C02, 04, 05, & 06)		6312
	5B	Wildlife and Fish Resource Management (C01)		6179
	5B	Silvicultural Prescriptions (E03, 06, & 07)	0324	
Loss of habitat effectiveness due to disturbances	3A, 4C, 9B	Wildlife Habitat Improvement and Maintenance (C02, 04, 05, & 06)	0155	

TABLE IV-58. (Cont.)

POTENTIAL IMPACT	LOCATION*			
	FOREST DIRECTION/ PRESCRIPTION NUMBER	MANAGEMENT ACTIVITY DESCRIPTION AND NO.	GENERAL DIRECTION STATEMENT NUMBER	STANDARD AND GUIDELINE NUMBER
	4B, 4C, 4D	Transportation System Management (L01 & 20)	0342	
	4D	Wildlife and Fish Resource Management (C01)	0419	6250
	5A, 5B	Wildlife and Fish Resource Management (C01)		6171
Loss of special habitat needs	FD	Diversity on National Forests and National Grasslands (A00)	2000GM	6021, 6022
	FD	Wildlife and Fish Resource Management (C01)		8061GM, 8062GM, 8063GM, 8064GM, 8065GM, 8066GM, 8067GM, 8068GM, 8070GM
	4B	Wildlife and Fish Resource Management (C01)		6260, 6334
	4B, 5B	Wildlife and Fish Resource Management (C01)		6191
	4D	Wildlife and Fish Resource Management (C01)	0490	6251
	4D	Fuel Treatment (P11 through 14)	0483	
Loss of big game winter range	FD, 5A, 5B	Rights-of-Way and Land Adjustments (J02, 13, 15, 16, 17, & 18)	0319	
	5A, 5B	Range Resource Management (D02)	0315	

TABLE IV-58. (Cont.)

POTENTIAL IMPACT	LOCATION*			
	FOREST DIRECTION/ PRESCRIPTION NUMBER	MANAGEMENT ACTIVITY DESCRIPTION AND NO.	GENERAL DIRECTION STATEMENT NUMBER	STANDARD AND GUIDELINE NUMBER
	4B, 4C, 5A, 5B	Range Resource Management (D02)		6172
	5B	Range Resource Management (D02)		6173
Overuse of forage by livestock in range types (conflicts with livestock use)	FD	Range Resource Management (D02)	0058	6041
	5B	Range Resource Management (D02)	0316	
	5B	Range Resource Management (D02)		6173
	6A, 6B	Wildlife and Fish Resource Management (C01)	0330	
Loss of T & E habitat	FD	Wildlife and Fish Resource Management (C01)	0740	
	FD	Minerals Management-Oil, Gas, and Geothermal (G02 & 04)	2140GM	
	FD	Minerals Management-Leasable Uranium and Non-energy Common Minerals and Materials (G03, 05, 06, & 07)	2141GM	
Loss of fishing habitat	FD	Wildlife and Fish Resource Management (C01)	0290	
	9A	Wildlife Habitat Improvement and Maintenance (C02, 04, 05, & 06)	0660, 0664	

TABLE IV-58. (Cont.)

POTENTIAL IMPACT	LOCATION* FOREST DIRECTION/ PRESCRIPTION NUMBER	MANAGEMENT ACTIVITY DESCRIPTION AND NO.	GENERAL DIRECTION STATEMENT NUMBER	STANDARD AND GUIDELINE NUMBER
Increased fishing pressure reducing creel size and number of fish caught	FD	Wildlife Habitat Improvement and Maintenance (C02, 04, 05, & 06)	2066GM	
AQUATIC ECOLOGY MITIGATION MEASURES				
Habitat alteration including stream bank disruption	FD	Dispersed Recreation Management (A14 & 15)	0353	
	FD	Riparian Area Management (F03)	0403, 0402 2120GM	6147
	10E	Water Resource Improvement and Maintenance (F05 & 06)	0307, 0003	
	9A	Soil Resource Management (KA1)	0003, 0091	
	9A	Transportation System Management (L01 & 20)	0724	
	9A	Wildlife Habitat Improvement and Maintenance (C02, 04, 05, & 06)	0402	6147
	9A	Water Resource Improvement and Maintenance (F05 & 06)	0686	
Livestock trailing	9A	Range Resource Management (D02)	0108, 0666	
Increased sedimentation	9A	Silvicultural Prescriptions (E03, 06, & 07)	0672	
	9A	Water Resource Improvement and Maintenance (F05 & 06)	0632, 0684, 0688	6001, 6060, 6650

TABLE IV-58. (Cont.)

POTENTIAL IMPACT	LOCATION* FOREST DIRECTION/ PRESCRIPTION NUMBER	MANAGEMENT ACTIVITY DESCRIPTION AND NO.	GENERAL DIRECTION STATEMENT NUMBER	STANDARD AND GUIDELINE NUMBER
	10E	Water Resource Improvement and Maintenance (F05 & 06)		6001, 6060
Loss of vegetation cover due to tree harvesting in riparian zone	9A	Silvicultural Prescriptions (E03, 06, & 07)	0088, 0668, 0726, 0670	
WATER MITIGATION MEASURES				
Decreased surface water quality	FD	Water Resource Improvement and Maintenance (F05 & 06)	0005	
	9A	Water Resource Improvement and Maintenance (F05 & 06)	0692	
Livestock use near water sources	4C	Range Resource Management (D02)	0413	6244, 6245
Use of chemicals, herbicides, etc.	FD	Water Resource Improvement and Maintenance (F05 & 06)	0678	
Surface water flow changes	FD	Water Uses Management (F04)	0009, 0602, 0604	
	1B	Silvicultural Prescriptions (E03, 06, & 07)	0610	
Loss of streambank stability	FD	Water Resource Improvement and Maintenance (F05 & 06)	0606	
	FD	Water Resource Improvement and Maintenance (F05 & 06)	0307	

TABLE IV-58. (Cont.)

POTENTIAL IMPACT	LOCATION* FOREST DIRECTION/ PRESCRIPTION NUMBER	MANAGEMENT ACTIVITY DESCRIPTION AND NO.	GENERAL DIRECTION STATEMENT NUMBER	STANDARD AND GUIDELINE NUMBER
	10E	Water Resource Improvement and Maintenance (F05 & 06)	0307, 0007	
	9A	Water Resource Improvement and Maintenance (F05 & 06)	6604	
Increased sedimentation	FD	Water Resource Improvement and Maintenance (F05 & 06)	0676, 0606	6606, 6320
Recreation use near water	9A	Water Resource Improvement and Maintenance (F05 & 06)	0488	
	FD	Dispersed Recreation Management (A14 & 15)	0353	
AIR QUALITY MITIGATION MEASURES				
Decreased air quality	FD	Air Resource Management (P16)	0094	
	FD	Wilderness Area Management (B02)	0188	
CULTURAL RESOURCES MITIGATION MEASURES				
Disturbance of National Register Eligible Sites	FD	Cultural Resource Management (A02)	0039	6310
Damage to sites not yet identified	FD	Cultural Resource Management (A02)	0131	
VISUAL RESOURCE MITIGATION MEASURES				
Long-term changes in visual quality from tree harvesting activities	FD	Visual Resource Management (A04)	0360, 0363, 0364 0365	8020GM, 8021GM, 6259, 8025GM
Long-term changes in visual quality from road construction/utility corridors	FD	Visual Resource Management (A04)	0360, 0363, 0364 0366, 0456	8020GM, 8021GM, 6276

TABLE IV-58. (Cont.)

POTENTIAL IMPACT	LOCATION* FOREST DIRECTION/ PRESCRIPTION NUMBER	MANAGEMENT ACTIVITY DESCRIPTION AND NO.	GENERAL DIRECTION STATEMENT NUMBER	STANDARD AND GUIDELINE NUMBER
	1D	Visual Resource Management (A04)	0295	
Long-term changes in visual quality from facility construction	FD	Visual Resource Management (A04)	0360, 0367	8020GM, 8021GM
	1D	Visual Resource Management (A04)	0384	
Long-term changes in visual quality from mineral activities	FD	Minerals Management - Oil, Gas, & Geothermal (G02 & 04)	2140GM	
	FD	Minerals Management - Coal, Leasable Uranium and Non-Energy Common Minerals and Materials (G03, 05, 06 & 07)	2141GM	
RECREATION MITIGATION MEASURES				
Dispersed recreation use exceeds capacity	FD	Developed Recreation Management (A14 & 15)	0040, 0352	6023, 8022GM 6195
	FD	Wilderness Area Management (B02)	0040	6023, 8022GM
	2A, 3A	Developed Recreation Management (A14 & 15)	0238	
	2A	Developed Recreation Management (A14 & 15)		6227
	2B	Developed Recreation Management (A14 &15)	0614	6269
	3A	Developed Recreation Management (A14 & 15)		6378
	4C, 4D	Developed Recreation Management (A14 & 15)	2031GM	
	FD	Silvicultural Prescriptions (E03, 06, & 07)		6042

TABLE IV-58. (Cont.)

POTENTIAL IMPACT	LOCATION*			
	FOREST DIRECTION/ PRESCRIPTION NUMBER	MANAGEMENT ACTIVITY DESCRIPTION AND NO.	GENERAL DIRECTION STATEMENT NUMBER	STANDARD AND GUIDELINE NUMBER
	5A, 5B	Developed Recreation Management (A14 & 15)	0654	6404
Dispersed recreation - trail use exceeds guidelines	FD	Developed Recreation Management (A14 & 15)	0352	6195
	2A, 3A	Developed Recreation Management (A14 & 15)	0238	
	2A	Developed Recreation Management (A14 & 15)		6227
	2B	Developed Recreation Management (A14 & 15)	0614	6269
	2B	Trail System Management (L23)	0439	
	3A	Developed Recreation Management (A14 & 15)		6378
	4C, 4D	Developed Recreation Management (A14 & 15)	2031GM	
	4B, 4C, 6A, 6B, 7A, 7C, 7E, 9A, 9B	Developed Recreation Mangement (A14 & 15)		6402
	5A, 5B	Developed Recreation Management (A14 & 15)	0654	6404
Conflicts with other resource uses	FD	Minerals Management General (G00)	0642, 0644, 0646	
	1A, 1B	Range Resource Management (D02)	0110	
	1A	Range Resource Management (D02)	0059	6281
	1B	Silvicultural Prescriptions (E03, 06, &07)	0468	
	2A, 2B, 3A	Range Resource Management (D02)	0158	

TABLE IV-58. (Cont.)

POTENTIAL IMPACT	LOCATION*			
	FOREST DIRECTION/ PRESCRIPTION NUMBER	MANAGEMENT ACTIVITY DESCRIPTION AND NO.	GENERAL DIRECTION STATEMENT NUMBER	STANDARD AND GUIDELINE NUMBER
	4C, 4D	Management of Developed Recreation Sites (A08, 09, 11, & 13)	0412	
	4B, 4C, 4D	Developed Recreation Management (A14 & 15)	0343	
	5A, 5B	Developed Recreation Management (A14 & 15)	0754	6662, 6664
Hazards to public	FD	Recreation Site Construction and Rehabilitation (A05 & 06)	0728, 0730	6632
	1A	Management of Developed Recreation Sites (A08, 09, 11, & 13)	0387	
	1B	Recreation Site Construction and Rehabilitation (A05 & 06)	0358	
Deviations from desired ROS classification	FD	Management of Developed Recreation Sites (A08, 09, 11, & 13)	0348	6193
Exceeding capacity in developed sites	1A	Recreation Site Construction and Rehabilitation (A05 & 06)	0383	
WILDERNESS MITIGATION MEASURES				
Acceptable use levels are exceeded	FD	Wilderness Area Management (B02)	0192, 0193, 0194	
	8A	Dispersed Recreation Management (A14 & 15)	0224, 0226	6128
	8B	Dispersed Recreation Management (A14 & 15)	0301	6372, 6336, 6374

TABLE IV-58. (Cont.)

POTENTIAL IMPACT	LOCATION*			
	FOREST DIRECTION/ PRESCRIPTION NUMBER	MANAGEMENT ACTIVITY DESCRIPTION AND NO.	GENERAL DIRECTION STATEMENT NUMBER	STANDARD AND GUIDELINE NUMBER
	3A	Dispersed Recreation Management (A14 & 15)	0238	
	8C	Dispersed Recreation Management (A14 & 15)	0636	6126, 6346, 6019, 6350, 6352, 6354
	8B	Dispersed Recreation Management (A14 & 15)	0626	
	6A, 6B, 7A, 7C, 7E, 9A, 9B, 10C	Dispersed Recreation Management (A14 & 15)	0650	
	8D	Dispersed Recreation Management (A14 & 15)		6125, 6356
Damage to sensitive areas from recreational livestock	FD	Wilderness Area Management (B02)	0204, 0176, 0206	6156, 6280
	6A	Range Resource Management (D02)		6156
	8D	Range Resource Management (D02)	0247, 0234	
Disturbance to natural ecological processes	FD	Dispersed Recreation Management (A14 & A15)	0040	6023
	FD	Wilderness Area Management (B02)	0040, 0187, 0190 0180	6023
	8A	Wildlife & Fish Resource Management (C01)	0220	
Impacts by livestock grazing & structural range improvements	FD	Wilderness Area Management (B02)	0177	6156
	6A, 6B, 8D	Range Resource Management (D02)		6156
	8A, 8B, 8C	Range Resource Management (D02)	0182	6130

TABLE IV-58. (Cont.)

POTENTIAL IMPACT	LOCATION* FOREST DIRECTION/ PRESCRIPTION NUMBER	MANAGEMENT ACTIVITY DESCRIPTION AND NO.	GENERAL DIRECTION STATEMENT NUMBER	STANDARD AND GUIDELINE NUMBER
	8A	Range Resource Management (D02)		6342, 6344
	8D	Range Resource Management (D02)	0241, 0235	
Mineral Development	8D	Wilderness Area Management (B02)	0476	
	FD	Mining Law Compliance and Administration (G01)	0025	
	FD	Minerals Management-Oil, Gas, and Geothermal (G02 & 04)	2140GM	
	FD	Minerals Management-Coal, Leasable Uranium and Non-Energy Common Minerals Materials (G03, 05, 06 & 07)	2141GM	
	8B, 8C, 8D	Transportation System Management (L01 & 20)	0213	6165
Impacts of surface occupancy activities authorized prior to wilderness designation	FD	Wilderness Area Management (B02)	0221	
	8B, 8C, 8D	Special Use Management (Non-Recreation) (J01)	0210	
Human activities not consistent with wilderness experience	FD	Wilderness Area Management (B02)	0209	
PROTECTION MITIGATION MEASURES				
Fuel accumulations from vegetative management activities	FD	Fuel Treatment (P11)	0113	6056
	1A, 1D	Fuel Treatment (P11)	0113	8224GM
	FD	Vegetation Treated by Burning (P15)	0101	

TABLE IV-58. (Cont.)

POTENTIAL IMPACT	LOCATION* FOREST DIRECTION/ PRESCRIPTION NUMBER	MANAGEMENT ACTIVITY DESCRIPTION AND NO.	GENERAL DIRECTION STATEMENT NUMBER	STANDARD AND GUIDELINE NUMBER
	1B	Fire Planning and Suppression (P01)		8224GM
Adverse impacts of prescribed fire in riparian areas	FD	Vegetation Treated Burning (P15)	0102	
Conflicts with other resources	FD	Transportation System Management (L01 & 20)	0075, 0452, 0076, 0077	6083
	2A, 2B, 4B, 4C, 4D, 5A, 5B, 6A, 6B, 7A, 7C, 7E, 9A, 9B, 10C	Dispersed Recreation Management (A14 & 15)		6083
	2A, 2B, 4B, 6A, 6B, 7A, 7C, 7E, 9A, 9B, 10C	Dispersed Recreation Management (A14 & 15)	0154	
	5A, 5B	Transportation System Management (L01 & 20)	0762, 0764, 0323	6668, 6670
Temporary road construction	FD	Soil Resource Management (KA1)	0608, 2214GM	6322
	FD	Local Road Construction and Reconstruction (L11, 12, &13)	2213GM	8202GM
Arterial-collector and local road construction	FD	Soil Resource Management (KA1)	0608	6322
	FD	Arterial and Collector Road Construction and Reconstruction (L02 - L09, L16 - L18)	0083	
	FD	Local Road Construction and Reconstruction (L11, 12, &13)	0084	
	FD	Road Maintenance (L19)	2200GM	6274, 6324
	1B	Local Road Construction and Reconstruction (L11, 12, &13)	0467	

TABLE IV-58. (Cont.)

POTENTIAL IMPACT	LOCATION* FOREST DIRECTION/ PRESCRIPTION NUMBER	MANAGEMENT ACTIVITY DESCRIPTION AND NO.	GENERAL DIRECTION STATEMENT NUMBER	STANDARD AND GUIDELINE NUMBER
	4C	Transportation System Management (L01 & 20)	0429	
	9A	Transportation System Management (L01 & 20)	0718, 0720	6628
Trail construction	FD	Trail System Management (L23)	0074, 0354	6198, 6199
	2A	Trail System Management (L23)	0164	6094, 6093
SOIL MITIGATION MEASURES				
Soil erosion and sedimentation	FD	Silvicultural Prescriptions (E03, 06, & 07)		6314
	9A	Transportation System Management (L01 & 20)	0720	
Mineral development	FD	Minerals Management - Oil, Gas, and Geothermal (G02 & 04)	2140GM	
	FD	Minerals Management - Coal, Leasable Uranium and Non-Energy Common Minerals Materials (G03, 05, 06, &07)	2141GM	
	9A	Mining Law Compliance and Administration (G01)	0706, 0708, 0710, 0712, 0716, 0714	6612, 6614, 6616, 6618, 6620, 6624 6626, 6622
Loss of soil productivity	FD	Soil Resource Management (KA1)	0608	6322
	9A	Soil Resource Management (KA1)	0694	
Soil disturbance	FD	Silvicultural Prescriptions (E03, 06, &07)		6314

TABLE IV-58. (Cont.)

POTENTIAL IMPACT	LOCATION*			
	FOREST DIRECTION/ PRESCRIPTION NUMBER	MANAGEMENT ACTIVITY DESCRIPTION AND NO.	GENERAL DIRECTION STATEMENT NUMBER	STANDARD AND GUIDELINE NUMBER
	FD	Soil Resource Management (KA1)	0608	6322
	9A	Soil Resource Management (KA1)	0003	
Soil compaction	FD	Silvicultural Prescriptions (E03, 06, &07)		6314
	9A	Silvicultural Prescriptions (E03, 06, & 07)		6314
Increased soil instability including soil creep and slumping	FD	Range Resource Management (D02)		6041
	FD	Silvicultural Prescriptions (E03, 06 & 07)		6314
	FD	Soil Resource Management (KA1)	0608	6322
LAND USE MITIGATION MEASURES				
Adverse visual impacts from utilities	FD	Special Use Management (Non-Recreation) (J01)	0072	
Disruption of big game winter range	5A, 5B	Special Use Management (Non-Recreation) (J01)	0320	
Conflicts with other resource uses	FD	Special Use Management (Non-Recreation) (J01)	0389	
	2A, 2B, 3A	Special Use Management (Non-Recreation) (J01)	0464	
	3A	Special Use Management (Non-Recreation) (J01)	0395	

* Referenced Forest Direction (FD), Prescription number, Management Activity Description number, General Direction number and Standard and Guideline number are located in Chapter III of the Forest Plan.

V. List of Preparers

CHAPTER V
LIST OF PREPARERS

Arnie Arneson - Recreation, Lands and Minerals Staff Officer
B.S. Forest Management

Twenty-five years Forest Service experience in various professional capacities at District, Supervisor, and Regional Office level.

Management Team member. Coordinated input for Recreation, Lands and Minerals. Assisted with document edit and review.

Irv Case - Forester
B.S. Forestry

Ten years Forester; eight years District Ranger; five years Forester at Supervisor's Office.

Interdisciplinary Team member. Staff support timber. Developed management concerns. Assisted with document edit and review.

Richard P. Cook - Norwood District Ranger
B.S. Forest Management

Seven years Forester, Assistant District Ranger; 12 years District Ranger.

Management Team member. Developed management concerns. Organized and conducted District public involvement. Provided direction for "on-the-ground" application of the Forest Plan. Mapped and verified land use allocations.

Darrell Crawford - Timber and Watershed Staff Officer
B.S. Forest Management

Twenty-eight years Forest Service experience in various professional capacities at District, Supervisor, and Regional Office level.

Management Team member. Developed management concerns. Coordinated timber, fire, soil and water input to Forest planning process. Assisted document edit and review.

Henry "Hank" Deutsch* - Public Information Officer
B.S. Forestry, M.S. Forestry, Post Graduate Work in National Resource Policy and Political Science

Eighteen years forester with private industry and public agencies in Tennessee, Kansas, Missouri, and Colorado; Two years forester, two years Public Information Officer with Forest Service.

News media liason in the Forest planning process. Team leader for Wild and Scenic Rivers Report. Assisted with document edit and review.

Dalton L. Ellis - Paonia District Ranger
B.S. Range Management

Seven years Range Conservationist and Assistant District Ranger. Six years District Ranger.

Management Team member. Developed management concerns. Organized and conducted District public involvement. Provided direction for "on-the-ground" application of the Forest Plan. Mapped and verified land use allocations.

Raymond J. Evans - Forest Supervisor
B.S. Forest Management

Five years Forester. Ten Years District Ranger. Five years Staff Officer and Program Manager for Recreation, Range, Wildlife, Watershed and Resources. Two years Deputy Forest Supervisor.

Forest Management Team Leader. Provided overall direction to the Forest Management Team and Interdisciplinary Team.

William R. Gast, Jr. - Land Management and Program Planning Staff Officer
B.S. Forestry, M.S. Outdoor Recreation

Four years resource management on Ranger Districts and two years Forester on a core team involved in unit planning. Three years Staff Officer for LM&PP and ID Team Leader. One year Staff Officer for LM&PP.

Management Team member. Provided direction and coordination for the overall development of the Draft EIS and Forest Plan. Assisted with document edit and review.

E. Polly Hammer - Forest Archeologist
B.A. Biology, M.A. Anthropology

Five years Forest Service experience as Archeologist, Supervisor Office level.

Interdisciplinary Team member. Staff support for cultural resource management.

Donald Heiser - Ouray District Ranger
B.S. Forest Management

Fifteen years Forester in timber and recreation management. Six years District Ranger.

Management Team member. Developed management concerns. Organized and conducted District public involvement. Provided direction for "on-the-ground" application of the Forest Plan. Mapped and verified land use allocations. Assisted with document edit and review.

Rodney C. Herrick* - Geologist
M.S. Geology

Four years Environmental Specialist, Wyoming Department of Environmental Quality. Four years Forest Service experience in minerals area management. One year physical resource specialist at Supervisor's Office.

Core Planning Team member. Staff support for minerals management. Coordinated physical resource input in the planning process.

John J. Hill - Geologist
B.A. Geology, M.S. Geology, M.S. Watershed Sciences

Four years underground geologist with private industry. Three years Forest hydrologist. Three years geologist on interdisciplinary team.

Delineated mineral leasing recommendations.

James E. Jacobson - Biological Resource Specialist
B.S. Forest and Wildlife Management

Eleven years Forester. Three years supervisory training instructor in Job Corps. Two years biological resource specialist in Supervisor's Office.

Core Planning Team member. Provided timber analysis, coordinated Automated Data Processing with Regional Office. Assisted with land stratification procedure. Coordinated biological resource input to Forest planning process. Responsible for compiling Forest Plan document. Assisted in document edit and review.

Michael C. Johnson - Interdisciplinary Team Leader
Bachelor in Landscape Architecture

Three years Forest Service experience in resource management. Five years land use and land management planning. Two years landscape architect in private practice.

Interdisciplinary Team Leader. Provided direction, coordination, and schedules for the Draft EIS, Forest Plan, Wilderness Study Reports, Wild and Scenic River Reports, Summaries and Public Involvement.

Ray Kingston - Soil Scientist
B.S. Agricultural Chemistry, and Soils, M.S. Soils and Water Science

Eight years soil scientist.

Interdisciplinary Team member. Staff support for soils resource input.

Kenneth Kiser - Community Planner/Economist
B.A. Environmental Planning, M.A. Public Administration, M.S. Resource Economics

One year Community Planner, California. Three years experience interdisciplinary team member. One year Forest Economist at Supervisor's Office.

Core Planning Team member. Assisted with public involvement. Helped develop issues and concerns. Provided social input to Forest planning process. Conducted economic analysis for the Plan and Final EIS.

Dennis C. Lothrop* - Sociologist
B.S. Sociology, M.S. Sociology, Ph.D. Sociology

Two years Forest Service experience, sociologist at Supervisor's Office. Ten years as Academician at college institutions. Five years sociologist for county governments and social research center.

Core Planning Team member. Assisted with public involvement and helped develop issues and concerns. Provided social input to Forest planning process.

Joseph Newton - Forester
B.S. Range Management

Ten years Forester in various professional capacities. Fifteen years Recreation and Lands Forester at District and Supervisor's Office.

Interdisciplinary Team member. Staff support for the lands function.

Gerald W. Nyborg - Range Conservationist
B.S. Forest and Range Management

Four years Forester. Ten years District Ranger. Seven years Range Conservationist at Supervisor's Office.

Interdisciplinary Team member. Staff support for range resource management. Assisted with document edit and review.

John W. Olen - Landscape Architect
B.S. Environmental Design

Fifteen years Landscape Architect. Member Forest Service interdisciplinary teams.

Core Planning Team member. Staff support for visual, recreation, wilderness and cultural resources. Assisted in document edit and review.

James E. Paxon, Jr. - Taylor River District Ranger
B.S. Forestry

Five years Timber Forester. Six years Recreation and Lands Forester. One year District Ranger.

Management Team member. Organized and conducted District public involvement. Provided direction for "on-the-ground" application of the Forest Plan. Mapped and verified land use allocations.

Stephen R. Pierce - Grand Junction District Ranger - Forester
B.S. Forest Science

Six years on Ranger Districts. Six years Work Program Officer and Deputy Center Director for Job Corps. Twelve years District Ranger.

Management Team member. Interdisciplinary Team member. Developed management concerns. Organized and conducted District public involvement. Provided direction for "on-the-ground" application of the Forest Plan. Mapped and verified land use allocations.

David T. Plunkett - Forester
B.S. Forest Science

Two years Forester with Northeastern Forest Experiment Station. Four years Forester on Ranger Districts and Supervisor's Office.

Core Planning Team member. Responsible for resource inventory and data base management. Coordinated physical resource input. Responsible for compiling Draft EIS document. Assisted with document edit and review.

Frank Robbins - Transportation Planner
B.S. Civil Engineering

Five years Field Construction Engineer with Kansas Highway Commission. Five years Structural and Facilities Engineer. Three years Transportation Planner.

Interdisciplinary Team member. Staff support for transportation planning. Developed cost and quantity coefficients for integrating road systems into land use allocations.

Robert Russell - Forest Hydrologist - Grand Junction District Ranger
B.S. Watershed Management, M.S. Environmental Studies

Two years Forester. Eight years Forest Hydrologist at Supervisor's Office. Two years water quality specialist at Regional Office.

Interdisciplinary Team member. Management Team member. Staff support for water resource management. Developed methodology for water resource qualification. Assisted with document edit and review. Assisted with Draft EIS compilation.

D. V. Schilling* - Computer Specialist
B.S. Statistics

Four years computer specialist and statistician for Pacific Southwest Forest and Range Experiment Station. One year computer specialist at Supervisor's Office.

Interdisciplinary Team member. Coordinated Automated Data Processing needs with Regional Office. Assisted with System 2000 storage and retrieval. Initiated FORPLAN runs.

Paul Senteney - Range and Wildlife Staff Officer
B.S. Wildlife Management, M.S. Wildlife Management

Twenty-five years Forest Service experience in various professional capacities at District and Supervisor's Offices.

Management Team member. Coordinated input for range and wildlife. Assisted with document edit and review.

Dale F. Shanholtzer - Cebolla District Ranger
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Management Team member. Developed management concerns. Organized and conducted District public involvement. Provided direction for "on-the-ground" application of the Forest Plan. Mapped and verified land use allocations.

Gary B. Snider* - Economist
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One year Economist in cooperation with Rocky Mountain Forest and Range Experiment Station and the University of Arizona. Three years Forest Economist at Supervisor's Office.

Core Planning Team member. Provided information on selection and development of mathematical programming models. Formulated the FORPLAN model. Conducted economic analysis. Assisted with Draft EIS compilation.

Dawn K. Stoll - Computer Specialist
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Six months computer specialist at Supervisor's Office.

Assisted with System 2000 storage and retrieval and FORPLAN processing.

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E.M. Mining Engineering

Eight years Preconstruction, Construction and Zone Engineer. Six years Forest Engineer at Supervisor's Office.

Management Team member. Provided engineering input to Forest planning process. Assisted with document edit and review.

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B.S. Forest Management

Fourteen years Forester and District Resource Assistant. Four years Forest Recreation Specialist in Supervisor's Office.

Team leader for Wilderness Study Report. Staff support for recreation and wilderness.

Bernard H. Weisgerber - Collbran District Ranger
B.S. Forest Management

Sixteen years Forest Service experience in all phases of resource management. Three years District Ranger.

Management Team member. Developed management concerns. Organized and conducted District public involvement. Provided direction for "on-the-ground" application of the Forest Plan. Mapped and verified land use allocations.

Fred Wild - Wildlife Biologist
B.S. Biological Science

Five years Forester. One year Range Conservationist. Fourteen years Wildlife Biologist at Supervisor's Office.

Interdisciplinary Team member. Provided wildlife staff support.

Jimmy R. Wilkins* - Forest Supervisor (Retired)
B.S. Forestry

Two years fire research. Six years Forester. Five years District Ranger. Six years Range, Wildlife, Soils and Watershed Staff Officer. Three years Regional Range Group Leader. Seven years Forest Supervisor on the Grand Mesa, Uncompahgre, and Gunnison National Forests.

Forest Management Team leader. Provided overall direction to the Forest Management Team and Interdisciplinary Team.

*Indicates person no longer assigned to the Grand Mesa, Uncompahgre and Gunnison National Forests.

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